

WHAT IS CLAIMED IS:

1. A method of insulating a case of a rocket motor loaded with a solid propellant, said method comprising:

- 5 preparing insulation from a composition comprising a crosslinkable liquid polymer and carbon fibers, the composition including the crosslinkable liquid polymer in a sufficient concentration to permit the carbon fibers to be dispersed into the composition by mixing under substantially solvent-free conditions; and
- 10 curing the composition to form the insulation and insulating the case of the rocket motor with the insulation.

2. A method of insulating a case of a rocket motor loaded with a solid propellant, said method comprising:

- 15 preparing insulation from a composition comprising a crosslinkable EPDM terpolymer and carbon fibers, the crosslinkable EPDM terpolymer comprising a crosslinkable liquid EPDM terpolymer in a sufficient concentration to permit the carbon fibers to be dispersed into the composition by mixing under substantially solvent-free conditions; and
- 20 curing the composition to form the insulation and insulating the case of the rocket motor with the insulation.

3. The method of claim 2, wherein said insulating comprises applying the insulation to an interior surface of the case and interposing the insulation between the interior surface and the solid propellant.

4. The method of claim 3, wherein 100 weight percent of the crosslinkable EPDM terpolymer in the composition consists of the crosslinkable liquid EPDM terpolymer.

5. The method of claim 3, wherein at least about 95 weight percent of the crosslinkable EPDM terpolymer in the composition consists of the crosslinkable liquid EPDM terpolymer.

6. The method of claim 3, wherein at least about 90 weight percent of the crosslinkable EPDM terpolymer in the composition consists of the crosslinkable liquid EPDM terpolymer.

7. The method of claim 3, wherein said preparing of the insulation comprises mixing the composition in a vertical-blade mixer or sigma-blade mixer.

8. The method of claim 3, wherein at least about 50 weight percent of the crosslinkable EPDM terpolymer in the composition consists of the crosslinkable liquid EPDM terpolymer, and further wherein said preparing of the insulation comprises mixing the composition in a sigma-blade mixer.

9. The method of claim 2, wherein the composition comprises dry ingredients, and wherein said preparing of the insulation comprises mixing the composition under conditions in which the composition comprises not more than

about 5 weight percent of volatile solvent based on the dry ingredients in the composition.

10. The method of claim 2, wherein said preparing of the insulation
5 comprises mixing the composition in the absence of any volatile solvent.

11. A method of insulating a case of a rocket motor loaded with a solid propellant, said method comprising:

10 providing a kneader comprising at least one housing module provided with a chamber, a plurality of kneader pins extending radially into the chamber from the housing module, and a screw which is rotatable about a longitudinal axis thereof and movable along the longitudinal axis in a reciprocating motion, the screw having a peripheral surface including a plurality of screw flights arranged to collectively define a discontinuous screw thread extending along the longitudinal axis of the screw;

15 preparing insulation from a composition comprising at least one crosslinkable polymer and carbon fibers, said preparing of the insulation comprising introducing the composition into the kneader, and rotating the screw along the longitudinal axis thereof while superimposing the longitudinal reciprocating motion to the screw; and

20 curing the composition to form the insulation and insulating the case of the rocket motor with the insulation.

12. A method of insulating a case of a rocket motor loaded with a solid propellant, said method comprising:

25 providing a kneader comprising at least one housing module provided with a chamber, a plurality of kneader pins extending radially into the chamber from the housing module, and a screw which is rotatable about a longitudinal axis thereof and

movable along the longitudinal axis in a reciprocating motion, the screw having a peripheral surface including a plurality of screw flights arranged to collectively define a discontinuous screw thread extending along the longitudinal axis of the screw;

preparing insulation from a composition comprising at least one crosslinkable

- 5 EPDM terpolymer and carbon fibers, said preparing of the insulation comprising introducing the composition into the kneader, and rotating the screw along the longitudinal axis thereof while superimposing the longitudinal reciprocating motion to the screw; and

curing the composition to form the insulation and insulating the case of the

- 10 rocket motor with the insulation.

13. The method of claim 12, wherein said preparing of the insulation comprises mixing the composition in the kneader under substantially solvent-free conditions.

14. The method of claim 12, wherein said insulating of the case comprises applying the insulation to an interior surface of the case and interposing the insulation between the interior surface and the solid propellant.

15. The method of claim 12, wherein 100 weight percent of the crosslinkable EPDM terpolymer consists of crosslinkable liquid EPDM terpolymer.

16. The method of claim 12, wherein at least about 90 weight percent of the crosslinkable EPDM terpolymer consists of crosslinkable liquid EPDM
25 terpolymer.

17. The method of claim 12, wherein at least about 50 weight percent of the crosslinkable EPDM terpolymer consists of crosslinkable liquid EPDM terpolymer.

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18. The method of claim 12, wherein the composition is free of liquid EPDM.

19. The method of claim 12, wherein the composition comprises dry ingredients, and wherein said preparing of the insulation comprises mixing the composition under conditions in which the composition comprises not more than about 5 weight percent of volatile solvent based on dry ingredients in the composition.

20. The method of claim 12, wherein said preparing of the insulation comprises mixing the composition in the kneader in the absence of any volatile solvent.